UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/026,713	12/27/2001	Blair T. MacKiewich	A363 0016 GNM/bds	2000

720 7590 09/20/2005

OYEN, WIGGS, GREEN & MUTALA LLP
480 - THE STATION
601 WEST CORDOVA STREET
VANCOUVER, BC V6B 1G1
CANADA

EXAMINER	
DYKE, KERRI M	

ART UNIT	PAPER NUMBER
2667	

DATE MAILED: 09/20/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/026,713	MACKIEWICH ET AL.	
	Examiner	Art Unit	
	Kerri M. Dyke	2667	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *27 December 2001*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-36* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-7 and 9-36* is/are rejected.

7)☒ Claim(s) *8* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *27 December 2001* is/are: a)☐ accepted or b)☒ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date *10/26/2004*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Drawings

1. The drawings are objected to as failing to comply with 37 CFR 1.84(p)(5) because they do not include the following reference sign(s) mentioned in the description: Figure 4 element 120 and because they include the following reference character(s) not mentioned in the description: Figure 4 elements 101 and 105. Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Claim Rejections - 35 USC § 112

2. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

3. Claims 5, 23, and 29 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

4. Claim 1 includes the limitation that the second node is between the first node and the root node. Claim 5, which is dependent from claims 4 and 1, states that the second node is a root

node. It is unclear how the second node can be both a root node and between the first node and a root node.

5. Claim 23 recites the limitation "OAM cells" in line 16 of page 5 of the claims. There is insufficient antecedent basis for this limitation in the claim. Claim 21 includes the limitation of OAM cells, but claim 23 is dependent upon claim 20, not claim 21.

6. Claim 29 recites the limitation "OAM cells" in line 24 of page 6 of the claims. There is insufficient antecedent basis for this limitation in the claim. Claim 28 includes the limitation of OAM cells, but claim 29 is dependent upon claim 26, not claim 28.

Claim Rejections - 35 USC § 102

7. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

8. Claims 1-5, 11 are rejected under 35 U.S.C. 102(b) as being anticipated by Cabletron's SecureFast VLAN Operation Model Version 1.8, RFC 2643.

9. In regards to claim 1, RFC 2643 discloses a method for providing fault tolerance in a VLAN having a topology defined by a spanning tree having a root node and at least one leaf node (page 18), the root and leaf nodes interconnected by connections in a connection- based network (section 2.1, page 6), the method comprising: sending from a first node in a connection used by the VLAN, in a leaf-to-root direction a series of continuity checking packets; detecting the continuity checking packets at a second node in the connection wherein the second node is located between the first node and the root node; and, generating a request for a change in the

topology of the VLAN in response to not receiving one or more continuity checking packets at the second node. Page 17 discloses that the topology spanning tree server is invoked when a switched is either discovered or lost through the use of "Keepalive," i.e. continuity, packets. A request for topology change is made in response to not receiving continuity packets. Page 17 also discloses that the continuity packets are sent to each of the switch's neighbors, which means the packets travel in the leaf-to-root, as well as the root-to-leaf direction. It is not indicated which switch is the root and which are leaves, but if each switch is communicating with all of its neighbors then data must be flowing in both directions.

10. In regards to claim 2, RFC 2643 discloses the method of claim 1 comprising generating a connection-rerouting request in response to the request for a change in the topology of the VLAN. Page 18 discloses that a topology change notification BPDU is generated in response to a detected change. A topology change notification is a connection-rerouting request.

11. In regards to claim 3, RFC 2643 discloses the method of claim 1 wherein generating a request for a change in the topology of the VLAN comprises generating a topology change notification (Page 18).

12. In regards to claim 4, RFC 2643 discloses the method of claim 1 wherein the first node is at a leaf of the spanning tree. Any node can arbitrarily be designated the first node. Page 17 discloses that the continuity messages are sent in both the leaf-to-root and root-to-leaf direction. It is therefore inherently possible for the first node to be a leaf of the spanning tree.

13. In regards to claim 5, RFC 2643 discloses the method of claim 4 wherein the second node is at a root of the spanning tree. Page 17 discloses that the continuity messages are sent in both

the leaf-to-root and root-to-leaf direction. It is therefore inherently possible for the second node to be a root of the spanning tree.

14. In regards to claim 11, RFC 2643 discloses the method of claim 1 also comprising sending continuity checking packets from the root node to one or more leaf nodes of the spanning tree and detecting the continuity checking packets at the one or more leaf nodes of the spanning tree. Page 17 discloses that the topology spanning tree server is invoked when a switched is either discovered or lost through the use of "Keepalive," i.e. continuity, packets. A request for topology change is made in response to not receiving continuity packets. Page 17 also discloses that the continuity packets are sent to each of the switch's neighbors, which means the packets travel in the leaf-to-root, as well as the root-to-leaf direction.

Claim Rejections - 35 USC § 103

15. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

16. Claims 9-10, 25-27, and 31-36 are rejected under 35 U.S.C. 103(a) as being unpatentable over Cabletron's SecureFast VLAN Operation Model Version 1.8, RFC 2643 in view of Cabletron's VlanHello Protocol Specification Version 4, RFC 2641.

17. In regards to claim 9, RFC 2643 discloses the method of claim 1. It does not disclose the method further comprising monitoring a time elapsed since receipt of a continuity checking

packet at the second node and generating the request for a change in the topology of the VLAN if the time elapsed exceeds a threshold.

RFC 2641 discloses in section 2.1 on page 3 monitoring the time elapsed since receipt of a continuity packet and generating a topology change request if the time elapsed exceeds a threshold.

It would have been obvious to one of ordinary skill in the art to use the VlanHello protocol disclosed in RFC 2641 with the Vlan Operational Model disclosed in RFC 2643 because section 4.2.1 of RFC 2643 indicates that the continuity messages operate in accordance with the VlanHello protocol of RFC2641.

18. In regards to claim 10, RFC 2643 discloses the method of claim 1, but not further comprising monitoring a number of continuity checking packets received at the second node within a time window and generating the request for a change in the topology of the VLAN if the number of continuity checking packets received at the second node is less than a threshold number.

RFC 2641 discloses in section 2.1 on page 3 monitoring the time elapsed since receipt of a continuity packet and generating a topology change request if the time elapsed exceeds a threshold. Not receiving packets after an elapsed time can also be interpreted as receiving less than a threshold number of packets.

It would have been obvious to one of ordinary skill in the art to use the VlanHello protocol disclosed in RFC 2641 with the Vlan Operational Model disclosed in RFC 2643 because section 4.2.1 of RFC 2643 indicates that the continuity messages operate in accordance with the VlanHello protocol of RFC2641.

19. In regards to claim 25, RFC 2643 discloses a virtual LAN having a topology, the virtual LAN comprising: a plurality of network segments each bridged to a connection- oriented network (section 2.1 page 6); a plurality of connections in the connection-based network (Page 4 discloses that there can be 0-7 network links.), the connections interconnecting the plurality of network segments (it is inherent that the connections serve to connect the network segments); a packet source located on a first one of the connections (page 17), the packet source configured to generate and send on the connection continuity checking packets in a direction toward a root of the spanning tree; a packet sink located on the first one of the connections at a location between the packet source and the root of the spanning tree, the packet sink configured to receive the continuity checking packets and to generate a request for a change in the topology of the VLAN in response to not receiving one or more of the continuity checking packets sent by the packet source. Page 17 discloses that the topology spanning tree server is invoked when a switched is either discovered or lost through the use of Keepalive, i.e. continuity, packets. A request for topology change is made is response to not receiving continuity packets. Page 17 also discloses that the continuity packets are sent to each of the switch's neighbors, which means the packets travel in the leaf-to-root, as well as the root-to-leaf direction. RFC 2643 does not disclose sending the continuity packets temporally spaced.

RFC 2641 discloses sending continuity packets every 5 seconds in section 2.1 on page 2. It also discloses sending a request for topology change if packets are not received within a predetermined time period.

It would have been obvious to one of ordinary skill in the art to use the continuity packet protocol defined by RFC 2641 to trigger the topology changes of the network in RFC 2643

because section 4.2.1 on page 17 of RFC 2643 discloses that the protocol of RFC 2641 is supposed to be used.

20. In regards to claim 26, RFC 2643 and RFC 2641 disclose the virtual LAN of claim 25 wherein the topology is defined by a spanning tree (Page 18).

21. In regards to claim 27, RFC 2643 and RFC 2641 disclose the virtual LAN of claim 26 wherein the connection-based network comprises an ATM network. Page 10 discloses that the invention of RFC 2643 can operate over an ATM network.

22. In regards to claim 31, RFC 2643 and RFC 2641 disclose the virtual LAN of claim 26 comprising, on each of a plurality of the connections: a packet source configured to generate and send continuity checking packets at intervals to a corresponding packet sink located on the one of the plurality of the connections at a location between the packet source and the root of the spanning tree, the packet sink configured to receive the continuity checking packets and generate the request for a change in the topology of the VLAN in response to determining that a number of the continuity checking packets sent by the corresponding packet source have not been received. Pages 2-3 of RFC 2641 disclose that continuity packets are sent every 5 seconds and that a request for topology change will be triggered if packets are not received. Pages 17-18 of RFC 2643 indicate that the VLAN has a spanning tree topology. In the current configuration packets can be both sourced and sunk at each node of the tree, including every leaf and root.

23. In regards to claim 32, RFC 2643 and RFC 2641 disclose the virtual LAN of claim 31 wherein the spanning tree comprises a plurality of leaves and one of the packet sources is located at each of the leaves of the spanning tree. Pages 17-18 of RFC 2643 indicate that the VLAN has

a spanning tree topology. In the current configuration packets can be both sourced and sunk at each node of the tree, including every leaf and root.

24. In regards to claim 33, RFC 2643 and RFC 2641 disclose the virtual LAN of claim 32 wherein packet sinks corresponding to the packets sources located at the leaves of the spanning tree are located at the root of the spanning tree. Pages 17-18 of RFC 2643 indicate that the VLAN has a spanning tree topology. In the current configuration packets can be both sourced and sunk at each node of the tree, including every leaf and root.

25. In regards to claim 34, RFC 2643 and RFC 2641 disclose the virtual LAN of claim 33 comprising a VLAN-level fault tolerance mechanism wherein the packet sink is configured to trigger the VLAN- level fault tolerance mechanism in response to not receiving one or more of the continuity checking packets sent by the packet source. Pages 2-3 of RFC 2641 disclose that continuity packets are sent every 5 seconds and that a request for topology change will be triggered if packets are not received. Pages 17-18 of RFC 2643 indicate that the VLAN has a spanning tree topology. In the current configuration packets can be both sourced and sunk at each node of the tree, including every leaf and root. The fault tolerance mechanism is the topology change request, which will allow for calls to be routed around the failure.

26. In regards to claim 35, RFC 2643 and RFC 2641 disclose the virtual LAN of claim 33 wherein the root of the spanning tree is located at a bridge and the bridge generates and sends bridge protocol data units to other bridges located at the leaves of the spanning tree. Page 18 discloses that BPDU are exchanged. Page 17 discloses that the continuity packets are sent to each of the switch's neighbors and each switch can be viewed as a multiport bridge. Although it

is not indicated it is inherent that one of the bridges is the root and the other are leaves for each VLAN configuration.

27. In regards to claim 36, RFC 2643 and RFC 2641 disclose a method for providing fault tolerance in a VLAN having a topology, the VLAN comprising a plurality of segments interconnected by connections (page 4) in an ATM network (page 10) the method comprising: at a cell source on one of the connections generating a series of continuity checking cells; at a cell sink on the one of the connections receiving the continuity checking cells; determining that a number of the continuity checking cells sent by the cell source have not been received at the cell sink; generating a fault indication in response to determining that a number of the continuity checking cells have not been received at the cell sink; and, triggering a change in the topology of the VLAN in response to the fault indication. Pages 17-18 of RFC 2643 discloses that continuity packets are disclosed between the nodes, one of which can be designated as the sink and the other as the source. It is also disclosed that a request for topology change is invoked when continuity cells are not received, which is in accordance with section 2.1 on page 2 of RFC 2641.

28. Claim 6 is rejected under 35 U.S.C. 103(a) as being unpatentable over Cabletron's SecureFast VLAN Operation Model Version 1.8, RFC 2643 in view of ITU-T Recommendation I.610 (provided by applicant).

29. In regards to claim 6, RFC 2643 discloses the method of claim 1 wherein the connection-based network comprises an ATM network and sending a series of continuity checking packets (page 17). Page 10 discloses that the invention of RFC 2643 can operate over an ATM network. RFC 2643 does not disclose the use of OAM cells.

ITU-T Recommendation I.610 discloses using OAM cells for continuity checking in section 7.2 on page 27.

It would have been obvious to one of ordinary skill in the art to use OAM cells as described in I.610 to perform the continuity checking functions described in RFC 2643 because OAM cells are capable of providing five different features, including failure detection and fault localization, as described on page 2 of I.610.

30. Claims 20 and 22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Cabletron's SecureFast VLAN Operation Model Version 1.8, RFC 2643 in view of Cabletron's VlanHello Protocol Specification Version 4, RFC 2641 in further view of Marimuthu (US 5,878,232).

In regards to claim 20, RFC 2643 discloses a method for rerouting a connection in a connection-based network (section 2.1, page 6), the connection carrying data traffic between segments of a VLAN, the method comprising: configuring nodes at first and second ends of the connection respectively to source and sink continuity checking packets (section 4.2.1, page 17); sending continuity checking packets at a specified rate from the node at the first end of the connection; receiving the continuity checking packets at a packet sink at the node at the second end of the connection; generating a request for a change in the topology of the VLAN in response to the packet sink not receiving a predetermined number of the continuity checking packets; generating a reroute signal for the connection in response to the request for a change in the topology of the VLAN; and, rerouting the connection through the connection-based network in response to the reroute signal. Section 4.2.2.1 on page 18 discloses generating a request for a change in topology and generating a reroute signal for the connection. RFC 2643 does not

disclose using Ethernet, sending the continuity packets at a specified rate or requesting the change after receiving less packets than a threshold.

Marimuthu discloses using a plurality of Ethernet segments in column 4 line 5.

It would have been obvious to one of ordinary skill in the art to use Ethernet as taught by Marimuthu with the VLANs taught by RFC 2643.

The motivation for doing so is given by Marimuthu in column 4 lines 5-8, where it is disclosed that it is advantageous to use multiple protocols and because Ethernet is a common network protocol.

RFC 2641 discloses sending continuity packets every 5 seconds in section 2.1 on page 2. It also discloses sending a request for topology change if packets are not received within a predetermined time period.

It would have been obvious to one of ordinary skill in the art to use the continuity packet protocol defined by RFC 2641 to trigger the topology changes of the network in RFC 2643 because section 4.2.1 on page 17 of RFC 2643 discloses that the protocol of RFC 2641 is supposed to be used.

31. In regards to claim 22, RFC 2634, RFC 2641, and Marimuthu disclose the method of claim 20 wherein the VLAN comprises a plurality of segments interconnected in a topology defined by a spanning tree protocol having a root at the second end of the connection and a leaf at the first end of the connection. Pages 17 and 18 disclose that the VLAN has a spanning tree topology with a leaf at the first end and a root at the second end. (There must be at least one leaf and one root and either can be designated as the first end.)

32. Claims 7 and 28-30 are rejected under 35 U.S.C. 103(a) as being unpatentable over Cabletron's SecureFast VLAN Operation Model Version 1.8, 2643 in view of ITU-T Recommendation I.610 in further view of Cabletron's VlanHello Protocol Specification Version 4, RFC 2641.

33. In regards to claim 7, RFC 2643 and I.610 disclose the method of claim 6, but not wherein sending a series of OAM cells comprises sending OAM cells at intervals in the range of 1/10 second to 5 seconds.

RFC 2641 discloses on page 2 sending continuity packets at regular intervals, currently defined to be 5 seconds.

It would have been obvious to one of ordinary skill in the art to use the VlanHello protocol disclosed in RFC 2641 with the Vlan Operational Model disclosed in RFC 2643 because section 4.2.1 of RFC 2643 indicates that the continuity messages operate in accordance with the VlanHello protocol of RFC2641.

34. In regards to claim 28, RFC 2643 and RFC 2641 disclose the virtual LAN of claim 27 wherein the packet source is configured to generate and send continuity cells and the packet sink is configured to receive the continuity cells. Using OAM for the continuity cells is not disclosed.

ITU-T Recommendation I.610 discloses using OAM cells for continuity checking in section 7.2 on page 27.

It would have been obvious to one of ordinary skill in the art to use OAM cells as described in I.610 to perform the continuity checking functions described in RFC 2643 because OAM cells are capable of providing five different features, including failure detection and fault localization, as described on page 2 of I.610.

35. In regards to claim 29, RFC 2643, RFC 2641, and I.610 disclose the virtual LAN of claim 26 wherein the packet source is associated with a timer and the packet source is configured to generate and send the OAM cells at equally spaced-apart times (section 2.1 on pages 2 and 3 of RFC 2641).

36. In regards to claim 30, RFC 2643, RFC 2641, and I.610 disclose the virtual LAN of claim 29 wherein the packet sink is associated with a timer and the packet sink is configured to generate the request for a change in the topology of the VLAN when a time longer than a threshold time has passed since the packet sink has received one of the OAM cells. Pages 17 and 18 of RFC 2643 indicate that a change for request will be made in response to network changes. Page 3 of RFC 2641 indicates that one of those changes is in response to not receiving a packet within a threshold time.

37. Claims 12-19, 21, and 23-24 are rejected under 35 U.S.C. 103(a) as being unpatentable over Cabletron's SecureFast VLAN Operation Model Version 1.8, 2643 in view of ITU-T Recommendation I.610 in further view of Cabletron's VlanHello Protocol Specification Version 4, RFC 2641 further in view of Marimuthu (US 5,878,232).

38. In regards to claim 12, RFC 2643 discloses a method for providing fault tolerance in a VLAN comprising a plurality of segments connected to an ATM network by bridges and an ATM virtual circuit extending between a first one of the bridges and a second one of the bridges, the method comprising: configuring nodes at first and second ends of the virtual circuit respectively to source and sink continuity checking cells; sending from a source port at the first end of the virtual circuit continuity checking cells; receiving the continuity checking cells at a sink port at the second end of the virtual circuit; and, generating a request for a change in the

topology of the VLAN in response to the sink port determining that it has not received a number of the continuity checking cells. Page 10 discloses that the invention of RFC 2643 can operate over an ATM network. Pages 17 and 18 disclose using continuity packets to trigger a request for a topology change. RFC 2643 does not disclose using Ethernet, OAM cells or sending the continuity packets at a specified interval.

Marimuthu discloses using a plurality of Ethernet segments in column 4 line 5.

It would have been obvious to one of ordinary skill in the art to use Ethernet as taught by Marimuthu with the VLANs taught by RFC 2643.

The motivation for doing so is given by Marimuthu in column 4 lines 5-8, where it is disclosed that it is advantageous to use multiple protocols and because Ethernet is a common network protocol.

RFC 2641 discloses in section 2.1 on page 3 monitoring the time elapsed since receipt of a continuity packet and generating a topology change request if the time elapsed exceeds a threshold. Not receiving packets after an elapsed time can also be interpreted as receiving less than a threshold number of packets.

It would have been obvious to one of ordinary skill in the art to use the VlanHello protocol disclosed in RFC 2641 with the Vlan Operational Model disclosed in RFC 2643 because section 4.2.1 of RFC 2643 indicates that the continuity messages operate in accordance with the VlanHello protocol of RFC2641.

ITU-T Recommendation I.610 discloses using OAM cells for continuity checking in section 7.2 on page 27.

It would have been obvious to one of ordinary skill in the art to use OAM cells as described in I.610 to perform the continuity checking functions described in RFC 2643 because OAM cells are capable of providing five different features, including failure detection and fault localization, as described on page 2 of I.610.

39. In regards to claim 13, RFC 2643, RFC 2641, I.610, and Marimuthu disclose the method of claim 12 comprising generating a signal to trigger a soft permanent virtual circuit reroute in response to the request for a change in the topology of the VLAN. A soft permanent virtual circuit is also known as a dynamic permanent virtual circuit. On page 7 it is disclosed that there is a permanent, default VLAN. Page 18 discloses that the VLAN circuit can be reconfigured or rerouted in response to a request for a topology change.

40. In regards to claim 14, RFC 2643, RFC 2641, I.610, and Marimuthu disclose the method of claim 12 wherein generating a request for a change in the topology of the VLAN comprises generating a spanning tree protocol topology change notification. Page 18 discloses that a topology change notification BPDU is generated in response to a detected change. A topology change notification is a connection-rerouting request.

41. In regards to claim 15, RFC 2643, RFC 2641, I.610, and Marimuthu disclose the method of claim 14 wherein generating a request for a change in the topology of the VLAN comprises sending a BPDU to a node of the VLAN. Page 18 discloses that a topology change notification BPDU is generated in response to a detected change. A topology change notification is a connection-rerouting request.

42. In regards to claim 16, RFC 2643, RFC 2641, I.610, and Marimuthu disclose the method of claim 14 wherein generating a request for a change in the topology of the VLAN comprises

sending a BPDU to a root node of the VLAN. Page 18 discloses that a topology change notification BPDU is generated in response to a detected change. A topology change notification is a connection-rerouting request. The BPDU is sent to all nodes, so it will eventually reach a root node.

43. In regards to claim 17, RFC 2643, RFC 2641, I.610, and Marimuthu disclose the method of claim 12 wherein the sink port is at a root node of the VLAN, the source port is at a leaf node of the VLAN and the OAM continuity checking cells travel over the connection in a leaf-to-root direction. Pages 17 and 18 disclose that the VLAN has a spanning tree topology with a leaf at the first end and a root at the second end. (There must be at least one leaf and one root and either can be designated as the first end.) Page 17 discloses that the topology spanning tree server is invoked when a switched is either discovered or lost through the use of Keepalive, i.e. continuity, packets. A request for topology change is made is response to not receiving continuity packets. Page 17 also discloses that the continuity packets are sent to each of the switch's neighbors, which means the packets travel in the leaf-to-root, as well as the root-to-leaf direction.

44. In regards to claim 18, RFC 2643, RFC 2641, I.610, and Marimuthu disclose the method of claim 12 wherein the VLAN comprises a plurality of segments interconnected in a topology defined by a spanning tree protocol having a root at the second end of the virtual circuit and a leaf at the first end of the virtual circuit. Pages 17 and 18 disclose that the VLAN has a spanning tree topology with a leaf at the first end and a root at the second end. (There must be at least one leaf and one root and either can be designated as the first end.)

45. In regards to claim 19, RFC 2643, RFC 2641, I.610, and Marimuthu disclose the method of claim 12 comprising determining that the sink port has not received a predetermined number of the OAM continuity checking cells by determining that a time elapsed since receipt of a most recently received one of the OAM continuity checking cells exceeds a threshold time. RFC 2641 discloses in section 2.1 on page 3 monitoring the time elapsed since receipt of a continuity packet and generating a topology change request if the time elapsed exceeds a threshold.

46. In regards to claim 21, RFC 2643 and 2641, and Marimuthu disclose the method of claim 20 wherein the connection-based network comprises an ATM network, but not wherein the continuity checking packets comprise OAM cells. Page 10 discloses that the invention of RFC 2643 can operate over an ATM network.

ITU-T Recommendation I.610 discloses using OAM cells for continuity checking in section 7.2 on page 27.

It would have been obvious to one of ordinary skill in the art to use OAM cells as described in I.610 to perform the continuity checking functions described in RFC 2643 because OAM cells are capable of providing five different features, including failure detection and fault localization, as described on page 2 of I.610.

47. In regards to claim 23, RFC 2634, RFC 2641, and Marimuthu disclose the method of claim 22 comprising determining that the cell sink has not received a predetermined number of the continuity cells by determining that a time elapsed since receipt of a most recently received one of the continuity cells exceeds a threshold time. RFC 2641 discloses in section 2.1 on page 3 monitoring the time elapsed since receipt of a continuity packet and generating a topology

change request if the time elapsed exceeds a threshold. OAM cells being used for the continuity cells is not disclosed.

ITU-T Recommendation I.610 discloses using OAM cells for continuity checking in section 7.2 on page 27.

It would have been obvious to one of ordinary skill in the art to use OAM cells as described in I.610 to perform the continuity checking functions described in RFC 2643 because OAM cells are capable of providing five different features, including failure detection and fault localization, as described on page 2 of I.610.

48. In regards to claim 24, RFC 2634, RFC 2641, I.610, and Marimuthu disclose the method of claim 23 wherein the connection comprises a soft permanent virtual circuit and the reroute signal comprises a VC reroute signal. A soft permanent virtual circuit is also known as a dynamic permanent virtual circuit. On page 7 it is disclosed that there is a permanent, default VLAN. Page 18 discloses that the VLAN circuit can be reconfigured or rerouted in response to a request for a topology change. The BPDU is a type of VC reroute signal.

Allowable Subject Matter

49. Claim 8 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Conclusion

50. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

a. Drake Jr. et al. (US 5,289,460) discloses a spanning tree topology. The links are monitored and a change topology request is issued in response to a detected change.

b. Nishio et al. (US 6,041,037) discloses a VLAN in an ATM network which uses continuity packets for fault detection.

c. Natarajan et al. (US 6,304,546) discloses the use of continuity packets, which are called keepalive messages.

d. Heeran et al. (US 6,311,288) discloses and Ethernet VLAN which detects and reroutes around failures.

e. Chen et al. (US 6,353,593) discloses a VLAN with a plurality of protected connections.

f. Hassink et al. (US Pub 20030112749 A1) discloses sending continuity packets at a constant rate and requesting a topology change if packets are not received within a threshold time.

g. Cabletron's VLS Protocol Specification, RFC 2642 is the third component of Cabletron's VLAN system.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Kerri M. Dyke whose telephone number is (571) 272-0542. The examiner can normally be reached on Monday through Friday, 8:10 am - 4:15 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Chi Pham can be reached on (571) 272-3179. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

kmd

CHI PHAM
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2600

9/16/05